UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF INDIANA
NEW ALBANY DIVISION

MONROE COUNTY BOARD OF COMMISSIONERS, et al., *Plaintiffs*, v. UNITED STATES FOREST SERVICE, et al., Defendants.	Case No. 1:24-cv-01560-SEB-MKK **DECLARATION OF DR. SHERRY MITCHELL-BRUKER**

1. I am the founder and President of Friends of Lake Monroe ("FLM"), a plaintiff in the above-captioned case. I am submitting this declaration in support of Plaintiffs' Motion for Summary Judgment in the above-captioned matter, which challenges the U.S. Forest Service's ("Service's") Houston South Vegetation Management and Restoration Project ("Project").

2. FLM is a nonprofit, 501(c)(3) organization with hundreds of members and supporters in the Lake Monroe Watershed. Founded in 2016, FLM is a science-driven citizens' group dedicated to finding solutions to improve the water quality of Lake Monroe and enhancing its use as a drinking water, recreational, and ecological resource for all who use it. FLM's mission is to protect and enhance Lake Monroe and its watershed through science, advocacy, and public involvement. FLM accomplishes this by working collaboratively with citizens, government, and business to improve and support lake water quality, which is FLM's core focus.

3. Before founding FLM, I received extensive education and training in environmental science with a focus on hydrology. I received my Bachelor's degree in biology from Bellarmine College in Louisville, KY. Thereafter, I entered the Indiana University's School

of Public and Environmental Affairs, where I received both my Masters of Science and Ph.D in Environmental Science. My thesis entailed modeling the interactions between steady-state groundwater and surface waters. I have authored and co-authored numerous scientific publications and reports on a wide variety of topics related to hydrology, including surface-water flows, sediment transport, and ecohydrology. I have also given several presentations about my work at different scientific conferences, including the American Geophysical Union's bi-annual meetings. As discussed in further detail below, I also co-authored and contributed to portions of the 2022 Lake Monroe Watershed Management Plan, on which the Service relied when developing the Supplemental Environmental Analysis challenged in this case.

4. During my career, I have worked in academia, private industry, and public service. For example, I have held academic appointments at Indiana University and Oakland City University/Bedford College Center. I have served as a senior scientist for Wittman Hydro Planning Associates, Inc., where I led and conducted modeling studies to advise municipal water companies on water supply sources, well field operations, pumping impacts, and sustainability. In that role, I also analyzed stream flow, regional water trends and use to determine interactions between rivers, streams and well discharge.

5. As for my public service, I have worked for both the U.S. National Park Service and the U.S. Forest Service ("Service"). In the former, I served as a Lead Hydrologist for the Everglades National Park in Florida. There, I provided expertise and analysis in implementing largescale overhaul of hydrologic systems in the Everglades of South Florida, prepared scientific documents to assess impacts of proposed plans on fish and wildlife, and conducted research to inform park priorities. For the Service, I served as the Forest Hydrologist and Watershed Program Manager at Lassen National Forest in Northern California. In that role, I led a team of

hydrologists and soil scientists to plan and implement water- and soils-related aspects of forest management activities. This included implementing and documenting the effectiveness of "best management practices" ("BMPs")—not unlike those relied upon by the Forest Service in the above-captioned case. At Lassen, I also coordinated the Forest Service's Burned Area Emergency Response, and generally managed proposed projects and budgets with a view towards improving watershed improvement.

6. Although my career has taken me across the country, I have spent most of my life in Indiana and, thus, the state and its natural resources hold a special place in my heart. This includes Lake Monroe, which is the sole supply source of drinking water for more than 130,000 people in the City of Bloomington and portions of Monroe and Brown Counties. The lake hosts millions of visitors each year, which, in turn, yields millions of dollars in tourism revenue and industrial uses.

7. Despite Lake Monroe's ecological and economic value to the region, the water quality of the lake is much poorer than it should be. Test results from Lake Monroe show that both algae and mercury concentrations exceed Indiana's water quality standards. As a result, Lake Monroe has been added to the "Section 303(d) list," which identifies waters that are considered "impaired" in violation of the Clean Water Act. Lake Monroe's impairment is due to poor water transparency, serious shoreline erosion, and excessive phosphorus loading to the lake. Excessive phosphorus loading is associated with eutrophication, a process in which high phosphorus levels cause an increase in plant and algae production. When algae and sediment from erosion combine with disinfectants used in drinking water purification, toxic compounds are formed in drinking water. Harmful algae blooms have been found on the lake in each of the last 10 years.

8. FLM—and, ultimately, the Lake Monroe Watershed Management Plan—were born in response to the impairment of Lake Monroe's water quality. In addition to being a scientist with specialized experience about hydrology, I am also an avid kayaker and have been since at least 2005. I try to kayak on Lake Monroe at least once a month, weather permitting. On one of those outings, it became clear to me that Lake Monroe was suffering from serious water-quality issues. The water beneath my kayak exhibited remarkably low clarity and an unusually greenish tint, both of which can be indicative of elevated levels of organic matter in the water body. In attempting to learn what (if anything) was being done to safeguard the lake's water quality, I was shocked to discover that Lake Monroe did not have a watershed group or any comprehensive plan to improve water quality. I founded FLM to fill that gap.

9. Initially, FLM focused on educating the public, hosting volunteer events such as lakeshore cleanups, and compiling existing water quality data. This data confirmed that Lake Monroe contains elevated levels of phosphorous, which leads to more frequent and severe algal blooms. In bodies of freshwater, higher concentrations of phosphorous and nitrogen lead to eutrophication, a condition generally associated with harmful ecological effects (e.g., decreased biodiversity), toxicity, and health impacts to humans caused by harmful algal blooms that thrive in eutrophic conditions. These algal blooms are caused by type of plankton called cyanobacteria, which have the potential to produce toxins; however, even in the absence of cyanotoxins, exposure to algal blooms can and do cause less severe impacts such as skin irritation and rashes.

10. Under the national trophic state index rankings (a standardized metric for assessing phosphorous concentrations in waterbodies), Lake Monroe is considered eutrophic and, at times exceeds this threshold, becoming "hypereutrophic." Even untrained observers can see evidence of Lake Monroe's eutrophication in the form of recreational advisories that have been

posted on or near the lake every year since 2011. These advisories warn the public about the potential health effects (e.g., skin rashes and irritation, etc.) of swimming in the lake, and recommend rinsing any part of their body that may have come in contact with the lake's water.

11. Eutrophication of Lake Monroe also poses a serious threat to regional drinking water supplies. As explained, Lake Monroe is the sole source of drinking water for more than 130,000 people living nearby. As the presence of algae and sediment in this water source increases, water-treatment plants run by the City of Bloomington are forced to introduce increasing quantities of chlorine to treat that water. Chemical interactions between that chlorine and cyanobacteria found in Lake Monroe water leads to the presence of toxic, disinfectant byproducts (tri-halomethane and halo acetic acid) in the water ultimately used and consumed by those 130,000+ residents. To date, the quantity of disinfectant byproducts in Monroe County drinking water has not exceeded the Environmental Protection Agency's safety thresholds, although those levels have come remarkably to close exceeding those thresholds, including in 2016. Regardless, the effects of sustained, long-term exposure to these disinfectant byproducts is not well understood by the scientific community and may cause lasting detrimental impacts to residents' health, as tainted drinking water has in other communities throughout the United States.

12. The presence of algal blooms in Lake Monroe also imposes significant financial burdens during water-treatment operations necessary to make Bloomington's water safe. A report completed in 2019 found that under normal conditions, the total monthly cost of chemicals to treat Lake Monroe's water was $42,613; however, "total monthly costs under conditions with high organic content were $114,118: almost three times the costs under normal conditions." Friends of Lake Monroe, *Economic Valuation of Lake Monroe* at 1 (2019).

13. Based on my extensive training and experience, I understand that eutrophication is generally caused by multiple factors in the water body like surface exposure to light, elevated temperature, and the availability of excess nutrients (i.e., phosphorous and nitrogen) in the water column. The excess nutrients in Lake Monroe are transported to the lake from its watershed, which is 25 times larger than the lake itself. Transportation happens via two different, yet related, mechanisms. The first is "direct runoff," meaning nutrient-rich substances like fertilizer or sewage waste are suspended in and carried to the lake via water.

14. The second source of excess nutrients in Lake Monroe is "sedimentation," meaning that nutrients bound to soil are transported to and deposited in the lake. Like direct runoff events, significant sedimentation events can be triggered by heavy rainfall. Excess nutrients transported via soil accounts for roughly 50% of the phosphorous and nitrogen being deposited in Lake Monroe. This second delivery mechanism is particularly problematic because once this nutrient-rich soil is deposited along the lakebed, it creates a long-lasting reservoir of nutrients (called "legacy nutrients") that can and do spur recurring algal blooms in the future. In other words, these legacy nutrients create yet another potential source of eutrophication events that can be triggered long after the initial sedimentation event has occurred. This means that algal blooms can occur in Lake Monroe in response to nutrient pulses from external sources (e.g., runoff) and internal sources (e.g., legacy nutrients released from the lakebed).

15. Because other contributors to eutrophication such as temperature and light exposure are beyond our control, the key to improving water quality in Lake Monroe lies in limiting and/or reducing the amount of mobile phosphorous and nitrogen in the lake's watershed since those nutrients will likely end up in Lake Monroe via direct runoff or sedimentation. For this reason, in 2018, FLM led a coalition of stakeholders in seeking and ultimately obtaining a

grant from the Indiana Department of Environmental Management to develop a watershed management plan with funds made available through Section 319 of the federal Clean Water Act, 33 U.S.C. § 1329. In collaboration with several state and federal agencies, universities, and private entities, comprehensive studies of Lake Monroe and its watershed began shortly after the grant was awarded.

16. The final version of the Lake Monroe Watershed Management Plan ("WMP" or "the Plan") was published on February 23, 2022. In relevant part, the Plan confirmed that excess nutrient contribution is a significant driver of eutrophication in Lake Monroe. According to the WMP, the North Fork of Salt Creek appears to be the largest contributor of phosphorus with the South Fork not far behind. It also found that the South Fork of Salt Creek is the largest contributor of nitrogen by a significant margin. The WMP identified sedimentation as one of the primary vectors for excess nutrients in Lake Monroe, which is unsurprising given the steep banks and erodible soil surrounding the lake. For these reasons, the WMP ultimately concludes that "[t]he key to protecting and improving water quality in the lake is to keep pollutants such as sediment . . . from reaching the streams that flow into Lake Monroe."

17. In my professional opinion, the Forest Service's planned management activities in the Houston South area, including the prescribed burns scheduled for April 2023, undercut the goals of the WMP and will result in irreparable harm to Lake Monroe by adding significant quantities of phosphorous, nitrogen, and sediment to an already impaired waterbody. The Forest Service's plan, if allowed to proceed, will entail burning and logging thousands of acres the Lake Monroe watershed. Initial implementation of the Project calls for prescribed burns to occur in areas that, relative to the rest of the Project, are the nearest to Salt Creek—a major feeder for Lake Monroe—in terrain largely characterized by steep slopes already prone to erosion, during a month which typically sees higher than average rainfall totals. This is a dangerous recipe for creating

significant nutrient and sediment pulses in Lake Monroe. First, burning the undergrowth in the Project area will very likely destroy valuable buffer zones around the watershed that normally mitigate sediment and nutrient loading in streams that feed into Lake Monroe. This is especially concerning here, where the terrain is comprised of steep slopes and highly erodible soil types. Second, prescribed burning like that planned by the Forest Service here inherently mobilizes phosphorous and nitrogen by reducing organic matter to ash, making the nutrients found therein more readily conveyable in water or sediment flows. As described above, these water and sediment flows pose a direct threat to Lake Monroe's water quality by immediately increasing the nutrients availably to cyanobacteria and/or by adding to the legacy nutrients found along the lakebed. Hence, the addition of excess nutrients to Lake Monroe as a result of Project activities will irreparably harm my and FLM's members' interest in improving the water quality of Lake Monroe.

18. In my professional opinion, the Forest Service's assertion that BMPs will adequately mitigate water quality impacts is unsupported by evidence. As explained above, I was previously employed by the Forest Service to implement and document the efficacy of BMPs, especially those concerning surface-water and sediment flows. Based on that experience and the information made publicly available, it is my view that the Hoosier National Forest ("HNF") lacks the requisite documentation of its BMPs' efficacy to conclude with any reasonable certainty that the Project will be adequately mitigated by BMP implementation. Where, as here, the Forest Service has relied on its BMPs to indicate nutrient-load reductions, the agency must support its assertion with evidence, which it cannot do. As I have explained to the HNF in prior comments, the Service's own 2012 planning rule requires monitoring and reporting of watershed conditions to determine the extent forest management is affecting water quality, quantity, flow and physical features of aquatic, riparian or wetland ecosystems; however, despite having been due in 2016, no such report has been made available to the public. Instead, the Forest Service has

postponed that reporting due to staff vacancies and readily admitted that "[HNF] needs to seek better methods of conducting and assuring that the monitoring information gathered is recorded properly." In short, the HNF's track record regarding BMP implementation and documentation does not, in my professional opinion, engender confidence that planned BMPs will adequately mitigate potential nutrient loading as a result of the Project operations.

19. As explained herein, Project activities threaten to irreparably harm my and other FLM members' interest in improving the water quality of Lake Monroe by introducing nutrient-laden sediment that will likely remain on the lakebed for decades, contributing to algal blooms which further degrade Lake Monroe's water quality. As a result, the Forest Service's Project-related activities will irreversibly and gravely impair my interests—and the similar interests of other FLM members—in using, enjoying, and studying Lake Monroe without further impairment. A favorable order from this Court invalidating the unlawful analysis carried out by the Service would remedy the injuries to my and FLM's aesthetic, recreational, research, and professional interests in Lake Monroe and its watershed, including the Hoosier National Forest.

Pursuant to 28 U.S.C. § 1746, I hereby I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 11-27-2024

Sherry Mitchell-Bruker

Dr. Sherry Mitchell-Bruker